

## Laparoscopic surgical smoke absorbed into bloodstream

Surgical smoke from laparoscopic surgery has harmful byproducts that are absorbed into the patient's bloodstream, reaching toxic levels, new research shows.

Patients treated by laser or electro-surgery through a scope had acutely higher levels of methemoglobin and carboxyhemoglobin in their blood than control patients who had surgery using nonthermal methods.

These compounds are not capable of carrying oxygen to tissues. "Seventy-six percent of patients showed statistically elevated levels of methemoglobin after five minutes of surgery," said the researcher, Douglas E. Ott, MD, of Macon, Ga, who presented the findings at the American Society for Laser Medicine and Surgery meeting in Toronto in April. At 15 minutes, 96% of subjects had increased levels, and at 30 minutes, 100% had.

---

### Surgeons are advised to keep smoke to a minimum.

---

Normal levels are less than 1% for methemoglobin and less than 2% for carboxyhemoglobin, but smoke exposure raised levels to 4.2% and to as high as 18%, respectively.

"That is an elevation that makes your eyes open wide," Dr Ott said. Levels in controls remained below 1% for methemoglobin and 3% for carboxyhemoglobin.

After surgery, about two-thirds of patients returned to preoperative levels within 60 to 120 minutes.

Patients who've had smoke-generating surgery also showed what Dr Ott called "soft signs." Compared to controls, they had more postoperative headaches, double vision, muscle weakness and nausea vomiting. All patients had the same anesthetic and were matched for age and sex.

"Headache is so ubiquitous that it's not easy to say it's cause and effect. But my belief is that it is."

Dr Ott noted that pulse oximetry does not detect the elevated methemo-

globin and carboxyhemoglobin levels, "so there may be a risk that patients could become anoxic."

What do these findings mean for patients?

In a healthy patient with short-term exposure, effects probably aren't significant, he said. The possible harm of the smoke exposure is outweighed by the benefits of surgery. But effects might be more serious for a sick patient who had longer surgery.

"We'd like 10 to 15 years of research on this, but it's only been reported for 6 months."

In view of the findings, he advised surgeons to keep smoke to a minimum and evacuate smoke efficiently to reduce exposure. □

#### References

- OR exposure to electrosurgery smoke a concern. *OR Manager* 9 (June 1993) 1+.
- Ott, D. Smoke production and smoke reduction in endoscopic surgery: Preliminary report. *Endoscopic Surgery & Allied Technologies* 1 (1993) 230-232.